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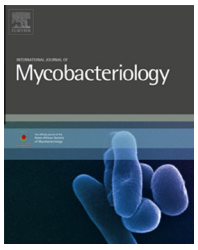

The antimicrobial effect of aquatic extract of *Salvadora persica* on *Mycobacterium bovis in vitro*

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ABSTRACT

Aim and objective: Infecting around one-third of the world population, *Mycobacterium tuberculosis* (MTB) is a serious health-threatening pathogen worldwide. Although TB has been a well-known disease since ancient times and despite the advances in medical sciences, large numbers of patients still died because of TB infection.

In 2012, 1.1 million people died as a result of that infection. The development of new drugs is critical for the future control of tuberculosis (TB), and a number of promising compounds are currently in the pipeline at various stages of drug discovery and clinical development. Synthetic antibiotics for MTB treatment brought about the emergence of multidrug resistant (MDR) and extensively drug-resistant (XTB). MTB strains that has proved to be a serious challenge to global health; additionally, the long duration of treatment has various side effects. Therefore, the use of herbal medicines as an alternative or compliment to synthetic medicines has a considerable importance.

The Miswak plant, which is known as "Salvadora persica" of the "Salvadoraceae" family, is traditionally used to ensure oral hygiene among Muslim people in developing countries where it is growing. The antibacterial properties of *S. persica* originating from various geographic areas have already been reported.

The aim of this study is to detect the aquatic extract of *S. persica* activity on *Mycobacterium bovis*.

Material and method: Extraction: 100 ml of boiling water was poured on the stem of this plant, then left at room temperature for 4 h, and then filtered. The crystals were put in a bath for 8 h to get the condensed extract.

Phenotyping: The measurements of synthesized mycolic acids in Middlebrook culture showed growth of the bacteria. Therefore, even if the antigenic structures were destroyed, the cell wall did not form; hence the colony growth will be inhibited.

Micro dilution assay: Using the lyophilization powder of the *M. bovis* which was provided by the Pasteur Institute, antimicrobial extract susceptibility tests were performed by broth micro-dilution methods.

Result: The growth of each sample was examined three times with the following concentrations: 0.5, 1, 2.5, 5, 10, 15, 20, 25, and 30 mg/ml. The minimum inhibitory concentration for each bacteria sample became positive at 10 mg/ml each time, and the results of the first, second and third times are the same.

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Conclusion: As the incidence of *M. bovis* is increasing throughout the world, this study shows that *S. persica* has a high antibacterial effect on *M. bovis*. Other evaluations considering the effects of various herbal extracts as antibacterial agents, as well as *in vivo* examination of these extracts, are required to provide a natural, cost-effective and viable alternative for the traditionally less-effective antibiotics which are normally used.